

SOLAR RADIATION DATA FOR OCTOBER 1949

Explanation of tables 1 and 2 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in table 1 appears in vol. 75, No. 3, March 1947, p. 47.

Beginning with this issue, daily totals and weekly means of total solar and sky radiation received on a horizontal surface at Caribou, Maine, will appear regularly in table 2. The coordinates of the station are latitude $46^{\circ}52' N.$, longitude $68^{\circ}01' W.$, and the elevation is 7 meters. The horizon here is unusually free of obstructions and there will be no shading of the instrument at any time of the year. The station is equipped with an Eppley 180° pyrheliometer and Brown strip-chart potentiometer.

The record for Portland, Maine, is being resumed beginning with this issue, and will appear regularly in table 2. Publication of this record has been omitted since March 1949, pending an inspection of the station. Information concerning this station relative to coordinates, instrumental equipment, and observation to the free horizon is contained in the March 1949 issue of this publication.

In accordance with instructions regarding publication of solar radiation data at newly established stations, both of these stations have been officially inspected and approved.

At Ithaca, N. Y., use of a new planimeter has corrected evaluation of data. Publication of that record is being resumed with this issue.

Solar radiation equipment at Columbia, Mo., was transferred on October 21, 1949, from the University of Missouri to the Weather Bureau office. It was then discovered that the pyrheliometer bulb was defective because of the presence of innumerable water droplets on the inside of the bulb. Consequently, for an indeterminate period prior to October 1949, the published data for this station may be in error. Recordings and publication of data will be resumed as soon as installation of a replacement can be completed.

TABLE 1.—*Solar radiation intensities during October 1949*

[Gram calories per minute per square centimeter of normal surface]

TABLE 1.—*Solar radiation intensities during October 1949—Con.*

Date	Sun's zenith distance							Vapor pres- sure	
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°

LINCOLN, NEBR.

	Air mass										<i>mb.</i>	<i>mb.</i>
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77			
<i>October</i>												
11-----					1.32	1.24	1.00	0.99	0.90	8.4		8.4
12-----	0.81	0.92	1.05	1.20	1.29	1.21	1.08	.94	.84	7.8		8.1
13-----	.68	.77	.92	1.09	1.19	1.12	.94	.77	.67	8.7		10.6
17-----					1.14	1.01	.86	.71	.62	9.4		11.4
24-----					1.26	1.14	.96	.83	.72	5.1		5.6
27-----							.92	.84	.73	8.1		11.4
31-----	.81	.92	1.05	1.22	1.31	1.20	1.03	-----	-----	3.0		4.8
Means.....	.77	.87	1.01	1.17	1.25	1.15	.98	.85	.75			
Departures	.02	-.04	-.05	-.08	-.19	-.08	-.07	-.07	-.06			

TABLE MOUNTAIN, CALIF.

	Air mass									mb.	mb.
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
October											
2				1.47							
4		1.10	1.19	1.30	1.43						
6					1.48						
11					1.43						
12		1.12	1.20	1.31	1.43						
23					1.49						
26		1.21	1.29	1.39	1.51						
27					1.47						
28					1.46						
29					1.47						
31					1.49						
Means.....	1.14	1.23	1.33	1.47							
Departures..	-.01	-.01	-.01	+.01							

BOSTON, MASS.

	Air mass										<i>m.b.</i>	<i>m.b.</i>
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96			
<i>October</i>												
13						1.27	1.11	0.92	0.90	9.4	9.8	
14						1.32	1.20	1.14	1.05	10.2	10.6	
27				1.17		1.34	1.18	1.17	1.06	5.1	4.4	
28		0.56	0.65	1.22		1.29				6.8	7.2	
Means		56	65	1.20		1.30	1.16	1.08	1.00			
Departures		.01	.29	.16		.17	.25	.29	.32			

BLUE HILL, MASS.

		Air mass											
		4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86	mb.	mb.	
<i>October</i>													
1		0.93	1.02	1.14	1.34	-----	1.36	1.20	1.09	1.01	0.9	5.7	
2		.93	1.03	1.15	-----	-----	1.33	1.18	1.05	.93	7.0	7.8	
3		.90	1.00	1.12	1.29	-----	-----	1.25	1.11	.97	.88	8.9	8.8
5		-----	-----	-----	-----	-----	-----	-----	.89	.76	15.6	16.8	
6		.99	1.09	1.20	-----	-----	-----	-----	-----	-----	8.3	7.6	
10		-----	-----	.97	-----	-----	1.02	.72	.58	.52	20.0	20.0	
11		-----	-----	-----	-----	-----	.97	.89	.78	.70	18.3	21.1	
12		-----	-----	-----	-----	-----	1.25	1.10	.99	.85	19.7	14.6	
13		.95	1.11	1.31	-----	-----	1.23	1.01	.86	.80	8.5	8.4	
14		.90	1.10	1.33	-----	-----	1.32	1.18	1.06	.95	11.8	8.6	
16		.84	.99	1.13	1.34	-----	1.37	1.25	1.12	1.05	8.9	7.3	
20		-----	-----	-----	-----	-----	-----	-----	-----	-----	7.8	6.8	
21		.91	.99	1.14	1.27	-----	1.15	.85	.66	.55	8.3	7.7	
23		.92	1.01	1.14	1.27	-----	1.29	1.10	.97	.85	7.1	6.8	
27		1.03	1.12	1.24	1.40	-----	1.39	1.25	1.14	1.00	4.3	4.0	
Means		.93	1.01	1.15	1.28	-----	1.24	1.07	.94	.83	-----	-----	
Departures		+.07	+.07	+.05	-----	+.04	+.05	+.04	+.05	-----	-----		

RATIO BOSTON-BLUE HILL ON COMPARABLE DATES

*Extrapolated.

¹ Extrapolated.
¹ 75th Meridian Time.

TABLE 2.—*Daily totals and weekly means of solar radiation (direct + diffuse) received on a horizontal surface during October 1949*

Date	1949	Nashville, Tenn.	Wilmington, Del.	Newark, N. J.	Pittsburgh, Pa.	West Wetherham, Mass.	Blue Hill, Mass.	Boston, Mass.	Ithaca, N. Y.	Twin Falls, Idaho	East Lansing, Mich.	Madison, Wis.	Portland, Maine	Toronto, Canada	Caribou, Maine	Summit, Mont.	Paribanks, Alaska	
Oct. 1	604	552	392	433	446	433	432	392	435	449	449	469	448	429	475	402	133	159
Oct. 2	620	587	404	432	475	456	462	407	451	477	447	446	446	404	462	376	207	86
Oct. 3	587	533	312	327	456	456	457	407	451	424	424	412	412	394	420	325	289	65
Oct. 4	525	509	120	164	473	425	398	470	493	406	228	155	115	427	282	136	177	276
Oct. 5	625	534	288	304	484	458	389	474	239	177	228	145	223	201	270	161	395	52
Oct. 6	490	460	250	230	489	440	407	207	363	329	329	329	329	107	424	311	213	114
Oct. 7	480	408	288	260	410	484	334	307	84	491	163	149	353	414	365	302	318	106
Means	582	480	390	319	475	460	317	446	289	414	316	290	268	377	309	366	279	109
Departures	-17	-20	-82	-68	340	-45	+56	-7	+2	-10	+16	+13	-10	-61	+64	+15	-6	+92
Oct. 8	554	501	410	316	264	481	465	398	516	325	342	111	201	315	370	124	145	-38
Oct. 9	583	449	406	443	270	469	418	392	428	300	268	89	301	348	330	104	116	-21
Oct. 10	662	464	396	427	429	438	436	398	373	141	310	345	345	382	354	311	307	-1
Oct. 11	621	573	401	414	368	440	433	413	455	405	367	345	345	382	344	324	311	-59
Oct. 12	637	550	385	406	92	442	437	385	363	387	349	344	352	433	325	304	313	-79
Oct. 13	618	520	322	350	126	430	448	58	479	106	410	175	299	429	405	348	356	-67
Oct. 14	630	556	301	179	77	411	458	88	313	107	400	374	322	133	276	384	333	-60
Means	614	516	374	386	232	429	447	289	307	346	259	300	307	373	311	301	324	-64
Departures	+46	+27	-7	-10	-58	+48	+47	-3	+4	-16	-6	+16	+16	+71	-21	+73	+47	+17
Oct. 15	604	529	132	367	200	405	368	214	405	132	406	383	139	165	359	134	117	-24
Oct. 16	580	58	288	318	405	436	425	356	452	135	372	356	356	383	338	323	376	-24
Oct. 17	468	453	85	206	368	405	425	422	119	354	193	356	294	369	324	316	354	-24
Oct. 18	422	442	227	338	355	371	428	325	118	37	214	61	129	297	222	232	224	-24
Oct. 19	578	622	411	418	360	421	424	201	377	127	394	112	242	194	244	252	283	-106
Oct. 20	507	404	335	383	411	410	393	355	434	370	401	163	328	369	322	313	112	-106
Oct. 21	582	502	378	414	406	393	312	432	433	342	138	280	315	209	348	323	324	-83
Means	493	444	234	314	309	405	410	249	372	210	341	294	290	359	309	304	235	-45
Departures	-88	-17	+5	+39	-53	-34	-18	-10	-53	-48	-34	-13	-53	-40	+45	+29	+11	+1
Oct. 22	525	450	373	400	237	408	399	180	378	365	343	344	345	383	155	365	347	-115
Oct. 23	552	484	386	402	382	397	385	378	413	340	324	345	345	354	327	365	313	-106
Oct. 24	471	512	378	402	167	378	397	374	370	374	351	353	353	359	67	491	194	-98
Oct. 25	544	474	378	392	70	381	373	354	370	360	93	93	93	202	184	203	235	-80
Oct. 26	538	513	387	392	361	387	352	363	363	363	363	363	363	364	122	203	203	-42
Oct. 27	516	418	311	359	67	355	363	363	363	363	363	363	363	364	145	149	149	-52
Oct. 28	510	384	319	357	67	355	363	363	363	363	363	363	363	364	117	270	300	-20
Means	522	484	359	379	238	382	351	219	394	235	386	218	228	237	231	222	224	66
Departures	+27	+22	+54	+51	-10	+34	+21	-36	+58	+50	+67	-7	+12	+47	+102	+31	+83	+8

ACCUMULATED DEPARTURES ON OCTOBER 28, 1949

Note.—Values in parentheses are interpolated.

+392	+45	-11, 116	+6, 615	+10, 955	-1, 702	+1, 230	-882	... -882	+6, 440	+10, 528	+3, 952	+7, 091	+11, 830	-+1, 830	+3, 892	-3, 577	+9, 366	-+329	-+343
------	-----	----------	---------	----------	---------	---------	------	----------	---------	----------	---------	---------	----------	----------	---------	---------	---------	-------	-------

TABLE 3.—*Daily totals and weekly means of solar and sky radiation plus the radiation reflected from the ground as received on a vertical surface facing south at Blue Hill, Mass., during October 1949*

Date Gm cal cm ⁻²	1 507	2 432	3 494	4 255	5 194	6 462	7 318	Mean 380	8 97	9 66	10 394	11 245	12 453	13 460	14 517	Mean 319	15 74	16 542	17 428	18 237	19 439	20 420	21 476	Mean 374
Date Gm cal cm ⁻²	22 42	23 501	24 39	25 224	26 134	27 551	28 490	Mean 283																

TABLE 4.—*Daily totals and weekly means of solar and sky radiation plus the radiation reflected from the ground as received on a vertical surface facing north at Blue Hill, Mass., during October 1949*

Date Gm cal cm ⁻²	1 54	2 61	3 55	4 74	5 54	6 58	7 59	Mean 59	8 53	9 51	10 54	11 58	12 51	13 52	14 53	Mean 53	15 43	16 54	17 62	18 72	19 65	20 53	21 46	Mean 56
Date Gm cal cm ⁻²	22 39	23 45	24 23	25 59	26 44	27 47	28 50	Mean 42																